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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/611,414

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David P. Holden

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EXAMINER

SIMS, JASON M

ART UNIT

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1631

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DELIVERY MODE

10/14/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/611,414	Applicant(s) HOLDEN ET AL.	
	Examiner JASON M. SIMS	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15, 17, 19-21, 84 and 85 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15, 17, 19-21, and 84-85 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's made a statement under 103 (c), in the response filed 8/22/08, that discloses a common ownership between the instant patent application and prior art reference Glanowski et al. and therefore have overcome the rejection of claims under 35 USC 103. Because applicant has overcome the rejections in the final office action mailed out 6/26/2008, prosecution is being reopened with the newly made rejections in the instant office action.

Claims 16, 18, and 22-83 have been canceled in the response filed 2/14/2008.

Claims 1-15, 17, 19-21, and 84-85 are the current claims hereby under examination.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-15, 17, 19-21, and 84-85 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Because a physical transformation step is not recited in the process claims 1-15, 17, 19-21, and 84-85, said claims are analyzed to determine if they recite a tie to another category of invention. In the instant claims, no step is found that recites a tie to another category of invention and therefore causes said claims to being drawn to non-statutory subject matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-8, 10-12, 19-21, and 84-85 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koehler et al. (US A/N 2004/0018506) in view of Liu et al. (US P/N 6,920,398).

The claims are directed to a method for allelic classification, the method comprising:

I) acquiring intensity information for each of a plurality of samples wherein the intensity information for each sample of the plurality of samples comprises a first intensity component representing the detected emission of a first probe specific for a first allele of a gene and a second intensity component representing the detected emission of a second probe specific for a second allele of the gene;

II) forming a plurality of data sets from the intensity information, such that each data set comprises the first intensity component and the second intensity component from a respective one of the plurality of samples;

III) grouping the plurality of data sets into one or more data clusters by evaluating at least the relationship between the first intensity component and the second intensity component for each of the plurality of samples wherein each data cluster represents a

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discrete allelic classification comprising one of, a homozygous allelic combination comprising the first allele alone, a homozygous allelic combination comprising the second allele alone, or a heterozygous allelic combination comprising both the first allele and the second allele;

IV) defining bounds for each of the one or more data clusters;

V) generating a likelihood model that predicts the probability that an allelic combination of a selected sample from the plurality of samples will reside within the bounds of a particular data cluster of the one or more data clusters based upon the intensity information of the selected sample;

VI) applying the likelihood model to the intensity information of each of the plurality of samples to identify the allelic classification of each sample of the plurality of samples; and

VII) outputting the allelic classification of each of the plurality of samples to at least one of a user and a display.

Koehler et al. teach limitations of claim 1 as follows: Koehler et al. at paragraphs [0012] and [0607] teach producing assays which have probes for each allele. Koehler et al. further teach at paragraph [0015] services wherein the products, i.e. the allele probes, can be used to detect presence or expression of genetic material, which reads on step I) of claim 1. Koehler et al. at paragraph [0093] and Fig. 79 teach clustering data for two dyes, i.e. intensity measurements from allele specific probes, that are clustered for allele classification as either being homozygous or heterozygous or no amplification, which reads on steps II) and III) of claim 1. Koehler et al. teach at

paragraph [0608] and at Fig. 79-82 display bounds for each of the data clusters formed for possible allele classification, which reads on step IV).

Koehler et al. does not explicitly teach generating a likelihood model that predicts the probability that an allelic combination of a selected sample from the plurality of samples will reside within the bounds of a particular data cluster of the one or more data clusters based upon the intensity information of the selected sample.

However, Koehler et al. does teach classifying the samples based on the clustering data. Therefore, it is implied that the step of classifying samples, which is based on the intensity information from the samples combined with the clustered data of intensity information from a plurality of samples, reads on using a likelihood model that performs step V of the instant claim. This is because the classification is itself a prediction based on probability as taught at paragraphs [0093], [0611] – [0613], and Figs. 79-82. Furthermore, this step of classifying also implies the application of a likelihood model because it is used to classify the intensity data of each sample and predict outcomes of unknown samples.

Liu et al. at col. teaches a method of classifying alleles of clustered data, i.e. sets of data clustered into subsets, using a likelihood function at col. 3, lines 25-30, col. 7, lines 29-31 and at col. 8, lines 1-2.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to apply the likelihood model taught by Liu et al. to the sample sets obtained by Koehler et al. to classify alleles. This is because using various statistical methods for data analysis is within the ordinary skill of the artisan. Therefore, when

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looking to apply a statistical method for data analysis one of ordinary skill in the art would turn to available statistical methods, such as the likelihood model taught by Liu et al., which can be used for classifying alleles as taught by Koehler et al. and the results would have been predictable. Furthermore the use of different statistical methods for data analysis, such as in the instant case, is the use of obvious variations of the same method to arrive at the result. Therefore, one of ordinary skill in the art would have been capable of applying this known technique to a known data analysis that was ready for improvement and the results would have been predictable to one of ordinary skill in the art.

Koehler et al. further teach at paragraph [0607] outputting the results to a user via a discrimination viewer.

With respect to claim 2, Liu et al. teach a model-fit probability to the classification of a haplotype at col. 4, lines 7-17.

Liu et al. does not specifically teach using an in-class or a posteriori probability as in claims 3 and 4.

However, the use of varying probability functions for data analysis is considered a known technique that is applicable to the data for analysis. . Furthermore the use of different statistical methods for data analysis, such as in the instant case, is the use of obvious variations of the same method to arrive at the result. Therefore, one of ordinary skill in the art would have been capable of applying this known technique to a known data analysis that was ready for improvement and the results would have been predictable to one of ordinary skill in the art.

With respect to claim 12, Liu et al. at col. 15, lines 20-35 teach normalizing the genotyping data for the samples.

With respect to claim 13, Liu et al. teaches the use of controls in the datasets wherein the taught algorithms were applied, which involve iteratively scaling and fitting data.

With respect to claims 14, 15, and 17 Liu et al. teach using an iterative method for refining a likelihood model at col. 7, lines 29-31 and col. 8, lines 1-2.

With respect to claims 5-8, 11, and 84-85 Koehler et al. teach forming three distinct clusters with specific plots at col. Figs. 79-82 and paragraphs [0607] – [0613].

With respect to claims 9-10, Koehler et al. teach at the abstract, paragraphs [0005], [0008], [0231], and [0267] a system for making assays which detect SNP alleles to determine a classification of SNPs, which include mutations. Koehler et al. teach using the gene mutation database report provided for developing the probes for making genotyping assays, wherein the probes may be customized taking mutations into consideration.

With respect to claims 19-21, Koehler et al. at paragraph [0231], teach about an amplification protocol used for acquiring intensity information using Taqman.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

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If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marjorie Moran can be reached via telephone (571)-272-0720.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

// Jason Sims //

/Michael Borin, Ph.D./
Primary Examiner, Art Unit 1631